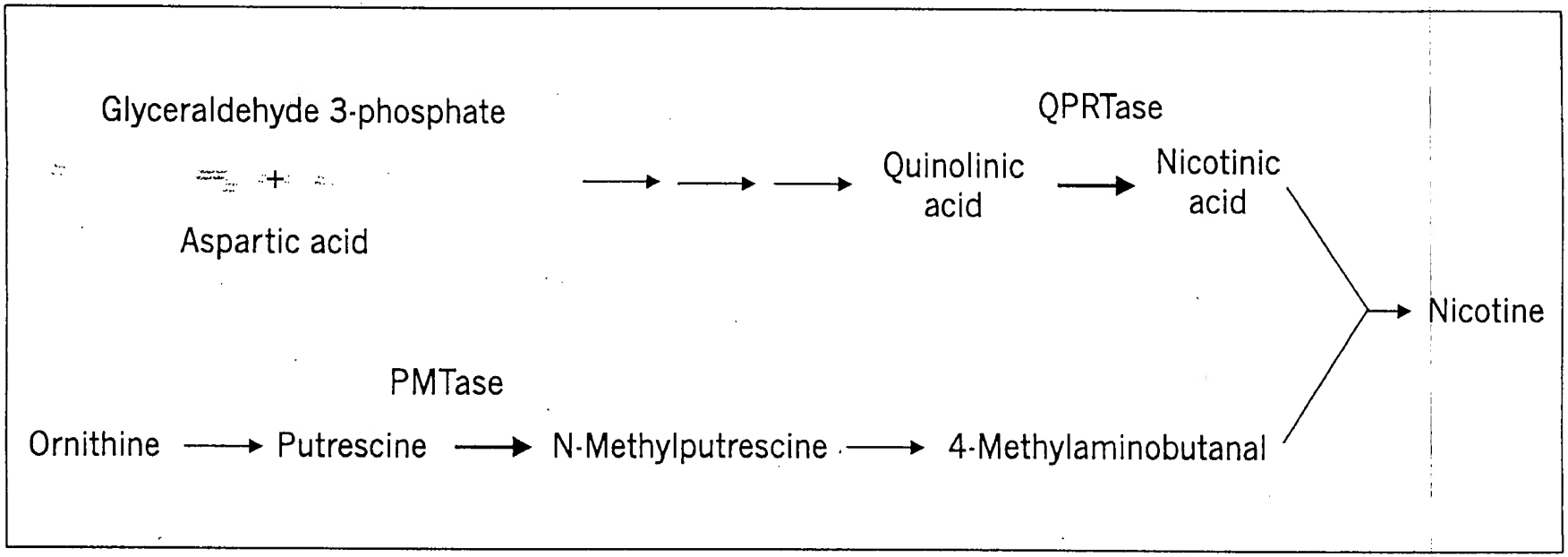
TOh260 0h2960

FIG. 1



caaaaactat tttccacaaa attcatttca caacccccc aaaaaaaaac cATGTTTAGA 60
GCTATTCCTT TCACTGCTAC AGTGCATCCT TATGCAATTA CAGCTCCAAG GTTGGTGGTG 120
AAAATGTCAG CAATAGCCAC CAAGAATACA AGAGTGGAGT CATTAGAGGT GAAACCACCA 180
GCACACCCAA CTTATGATTT AAAGGAAGTT ATGAAACTTG CACTCTCTGA AGATGCTGGG 240
TTTCTAGCAA AGGAAGACGG GATCATAGCA GGAATTGCAC TTGCTGAGAT GATATTCGCG 360
GAAGTTGATC CTTCATTAAA GGTGGAGTGG TATGTAAATG ATGGCGATAA AGTTCATAAA 420
GGCTTGAAAT TTGGCAAAGT ACAAGGAAAC GCTTACAACA TTGTTATAGC TGAGAGGGTT 480
GTTCTCAATT TTATGCAAAG AATGAGTGGA ATAGCTACAC TAACTAAGGA AATGGCAGAT 540
GCTGCACACC CTGCTTACAT CTTGGAGACT AGGAAAACTG CTCCTGGATT ACGTTTGGTG 600
GATAAATGGG CGGTATTGAT CGGTGGGGGG AAGAATCACA GAATGGGCTT ATTTGATATG 660
GTAATGATAA AAGACAATCA CATATCTGCT GCTGGAGGTG TCGGCAAAGC TCTAAAATCT 720
GTGGATCAGT ATTTGGAGCA AAATAAACTT CAAATAGGGG TTGAGGTTGA AACCAGGACA 780
ATTGAAGAAG TACGTGAGGT TCTAGACTAT GCATCTCAAA CAAAGACTTC GTTGACTAGG 840
ATAATGCTGG ACAATATGGT TGTTCCATTA TCTAACGGAG ATATTGATGT ATCCATGCTT 900
AAGGAGGCTG TAGAATTGAT CAATGGGAGG TTTGATACGG AGGCTTCAGG AAATGTTACC 960
CTTGAAACAG TACACAAGAT TGGACAAACT GGTGTTACCT ACATTTCTAG TGGTGCCCTG 1020
ACGCATTCCG TGAAAGCACT TGACATTTCC CTGAAGATCG ATACAGAGCT CGCCCTTGAA 1080
GTTGGAAGGC GTACAAAACG AGCATGAgcg ccattacttc tgctataggg ttggagtaaa 1140
agcagctgaa tagctgaaag gtgcaaataa gaatcatttt actagttgtc aaacaaaaga 1200
tccttcactg tgtaatcaaa caaaaagatg taaattgctg gaatatctca gatggctctt 1260
ttccaacctt attgcttgag ttggtaattt cattatagct ttgttttcat gtttcatgga 1320
atttgttaca atgaaaatac ttgatttata agtttggtgt atgtaaaatt ctgtgttact 1380
tcaaatattt tgagatgtt 1399

FIGURE 2A

MFRAIPFTAT VHPYAITAPR LVVKMSAIAT KNTRVESLEV KPPAHPTYDL 50
KEVMKLALSE DAGNLGDVTC KATIPLDMES DAHFLAKEDG IIAGIALAEM 100
IFAEVDPSLK VEWYVNDGDK VHKGLKFGKV QGNAYNIVIA ERVVLNFMQR 150
MSGIATLTKE MADAAHPAYI LETRKTAPGL RLVDKWAVLI GGGKNHRMGL 200
FDMVMIKDNH ISAAGGVGKA LKSVDQYLEQ NKLQIGVEVE TRTIEEVREV 250
LDYASQTKTS LTRIMLDNMV VPLSNGDIDV SMLKEAVELI NGRFDTEASG 300
NVTLETVHKI GQTGVTYISS GALTHSVKAL DISLKIDTEL ALEVGRRTKR 350
A 351

FIGURE 2B

```
N. tabacum          MFRAIPFTATVHPYAITAPRLVVKMSAIATKNTRVESLEVKPPAHPTYDL
R. rubrum           *--------RPNH----------------------PVAALS*F----AI
M. leprae           *--------LSDC----------------------EFDAAR--------
S. typhimurium      *--------PPRR*NPDDR*----------DALL*RINLDI*A----AV
E. coli             *--------PPRR*NPDTR*----------DELL*RINLDI*G----AV
H. sapien           *---------------D*EG*ALLLPPVTLAALVDSWLREDC*G------
S. cerevisiae       *---------------PVYE-HLLPVNGAWRQDVTNWLSEDV*S------

N. tabacum          KEVMKLALSEDAGNLGDVTCKATIPLDMESDAHFLAKEDGIIAGIA----
R. rubrum           D*AVRR**A**L*RA**I*ST****AATRAH*RFV*RQP**L**LGCA--
M. leprae           -DTIRR**H**LRYGL*I*TQ**V*AGTVVTGSMVPR*P*VIAGVDVALL
S. typhimurium      AQALREDLGGEVDAGN*I*AQL-L*A*TQAH*TVITR*D*VF----CGKR
E. coli             AQALREDLGGTVDANN*I*A*L-L*ENSR*H*TVITR*N*VF----CGKR
H. sapien           ----------------LNYAALVSGAGP*QAALWAKSP*VL----AGQP
S. cerevisiae       ----------------FDFGGYVVGSDLKEANLYCKQD*ML----CGVP

N. tabacum          -LAEMIFAEVDPSLKVEWYVNDGDKVHKGLK------FGKVQGNAYNIVI
R. rubrum           --RSAF-ALLDDTVTFTTPLE**AEIAA*QT------VAE*A*A*RT*LA
M. leprae           VLD*VF-GVDGYRVLY--R*E**ARLQS*QP------LLTVQAA*RGLLT
S. typhimurium      WVE*VFIQLAGDDVRLT*H*D***AI*ANQT------VFELN*PARVLLT
E. coli             WVE*VFIQLAGDDVTII*H*D***VINANQS------LFELE*PSRVLLT
H. sapien           FFDAIFTQL---NCQVS*FLPE*S*LVPVAR------VAEVR*P*HDLLL
S. cerevisiae       FAW*VFNQC---ELQVE*LFKE*SFLEPSKNDSGKIVVAKIT*P*K**LL

N. tabacum          AERVVLNFMQRMSGIATLTKEMAD--AAH--PAYILETRKTAPGLRLVDK
R. rubrum           ***TA***LGHL*****R*RRFG*AI*HT--R*RLTC****T****GLE*
M. leprae           ***TM***VCHM*****V*VAWV*AVRGT--K*KIRD****L****ALQ*
S. typhimurium      G**TA***V*TL**VASEVRRYVGLL*GT--QTQL*D****L****TAL*
E. coli             G*PTA***V*TL**VASKVRHYVELLEGT--NTQL*D****L****SAL*
H. sapien           G***A**TLARC****SAAAAAVEAARGAGWTGHVAG****T**F***E*
S. cerevisiae       ***TA**ILSRS****TASHKIISLARSTGYKGTIAG****T****RLE*

N. tabacum          WAVLIGGGKNHRMGLFDMVMIKDNHISAAGGVGKALKSVDQYLEQNKLQI
R. rubrum           Y**RC***S***F**D*A*L******AVA***SA**SRAR-AGVGHMVRI
M. leprae           Y**RV***V***L**G*TAL*****VA*V*S*VD**RA*R-AAAPEL-PC
S. typhimurium      Y***C***A***L**T*AFL******I*S*S*RQ*VEKAF-W*HPD-APV
E. coli             Y***C***A***L**S*AFL******I*S*S*RQ*VEKAS-W*HPD-APV
H. sapien           YGL*V**AAS**YD*GGLVML*D**VVPP***EK*VRAARQ---AADFAL
S. cerevisiae       YSM*V**CDT**YD*SS**ML*D***W*T*SITN*V*NARA---VCGFAV
```

FIGURE 3

```
N. tabacum          GVEVETRTIEEVREVLDYASQTKTSLTRIMLDNMVVPLSNGDIDVSMLKE
R. rubrum           EI****--L*QLA***AVGGAEV-----VL****-----DAPT----*TR
M. leprae           E****S--L*QLDAM*A-EEPEL-----*L***F--*VWQTQV----AVQ
S. typhimurium      E****N--LDELDDA*K-*GADI-----*****F-----NTDQ----MR*
E. coli             E****N--L**LD*A*K-*GADI-----*****F-----ETEQ----MR*
H. sapien           K****CSSLQ**VQAAE-*GADL-----VL***F------KPEELHPTAT
S. cerevisiae       KI***CLSED*AT*AIE-*GADV-----*****F------KGDGLK*CAQ

N. tabacum          AVELI---NGRFDTEASGNVTLETVHKIG-QTGVTYISSGALTHSVKALD
R. rubrum           **DMV---A**LV*****G*S*D*IAALA-ES**D***V*******TT**
M. leprae           RRDIR---APTVLL*S**GLS**NAAIYA-G***DYLAV*******RI**
S. typhimurium      **KRV---**QARL*V*****AE*LREFA-E***DF**VG******R***
E. coli             **KRT---**KALL*V*****DK*LREFA-E***DF**V*******Q***
H. sapien           *LKAQFPSVA---VEA**GIT*DNLPQF-CGPHIDV**M*M**QA*P***
S. cerevisiae       SLKNKWNGKKHFLLEC**GLN*DNLEEYLCD-DIDIY*TSSIHQGTPVI*
```

		% Identity	% Similarity
N. tabacum	ISKLIDTELALEVGRRTKRA		
R. rubrum	*G*D*VVA-----PPKAERA	15.9	43.2
M. leprae	*G*DL	18.3	37.3
S. typhimurium	LSMRFC	18.2	34.8
E. coli	LSMRFR	17.9	32.8
H. sapien	F***L---F*K*VAPVP*IH	16.8	31.7
S. cerevisiae	F***LAH	14.6	27.8

FIGURE 3 continued

FOn260 Dn23660

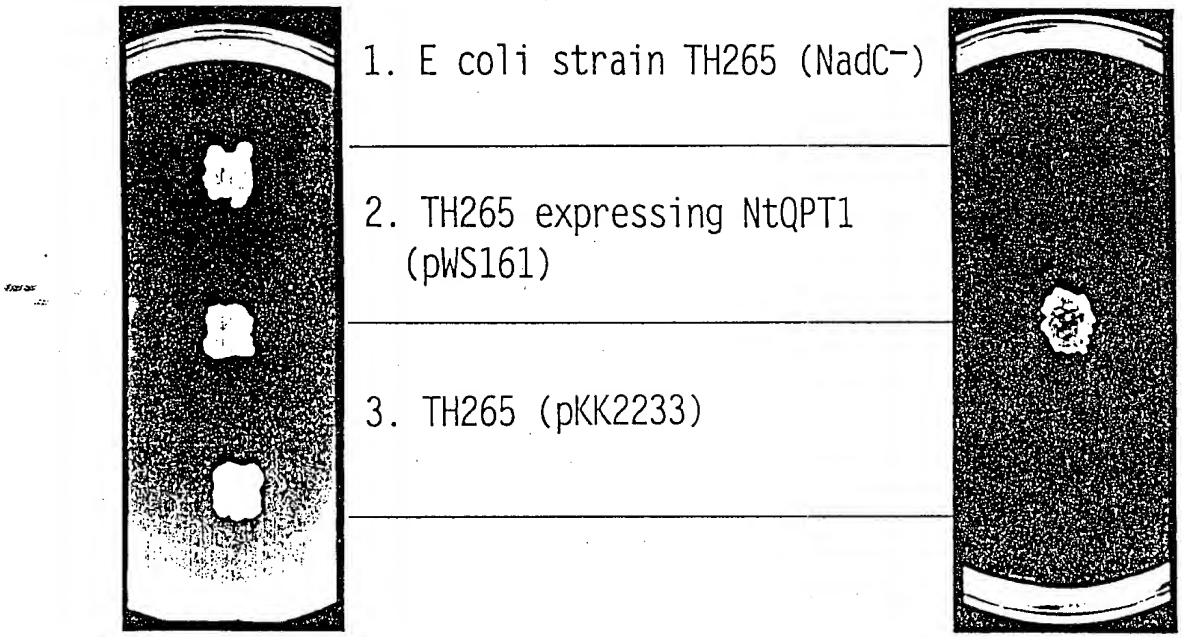


FIG.4

FIG. 5

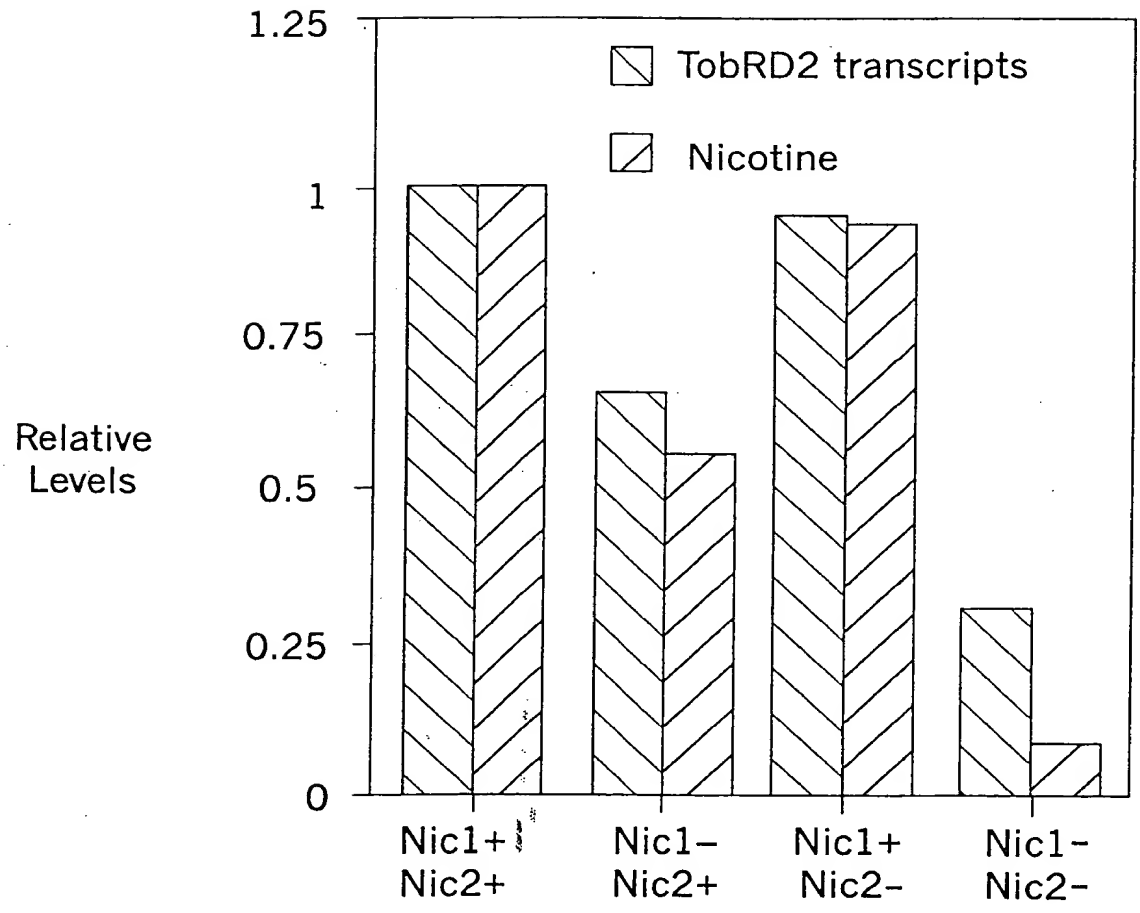
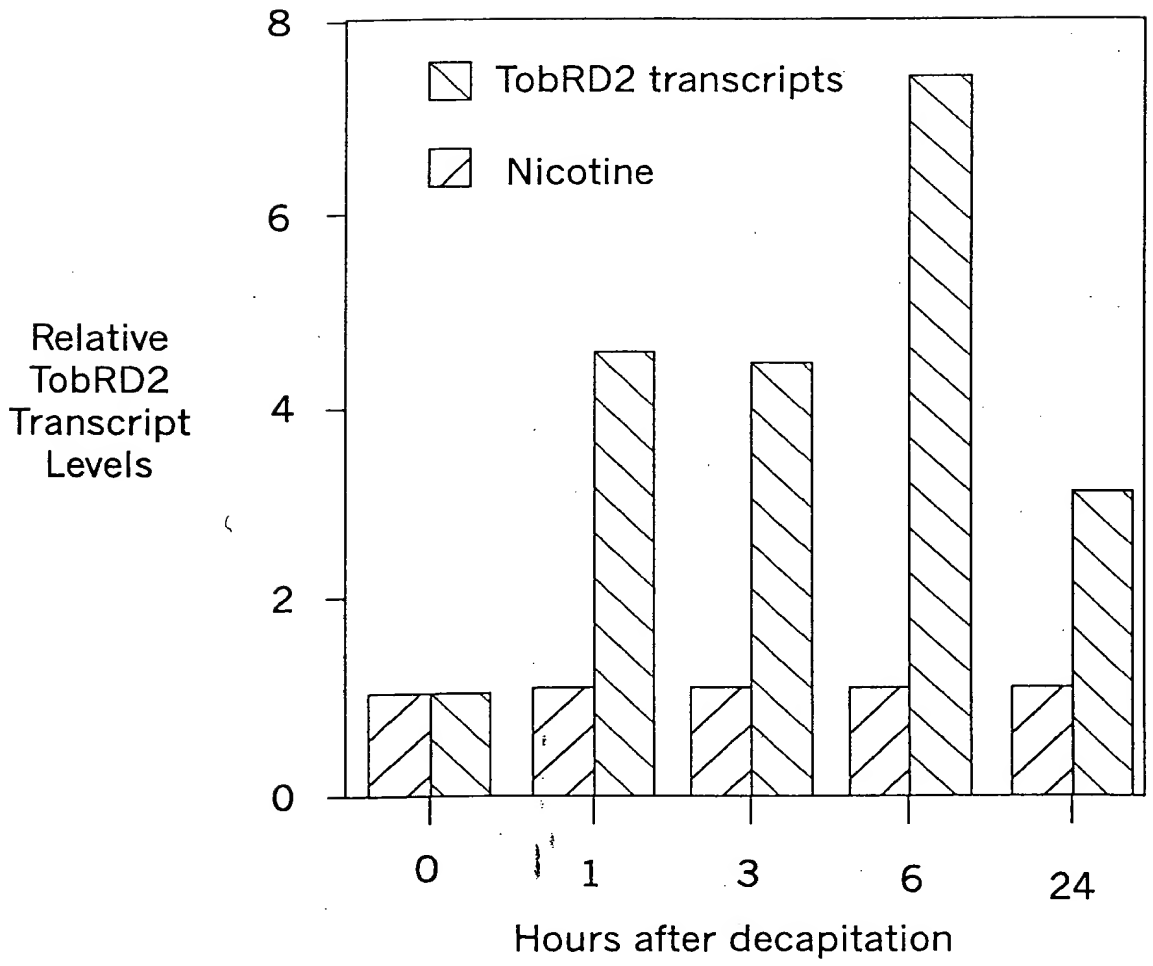

1.25
1
0.75
0.5
0.25
0
Relative Levels
TobRD2 transcripts
Nicotine
Nic1+ Nic2+
Nic1− Nic2+
Nic1+ Nic2−
Nic1− Nic2−

FIG. 6


Relative TobRD2 Transcript Levels
8
6
4
2
0
TobRD2 transcripts
Nicotine
0
1
3
6
24
Hours after decapitation